26°C. The effect of temperature on the size of the hatchlings may have been different from that reported in *Loligo pealei* by McMahon & Summers (1971).

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Comments on the Natural History of the *Ashmunella* (Gastropoda: Pulmonata: Polygyridae) of White Sands Missile Range (New Mexico, USA) and Fort Bliss (New Mexico and Texas, USA)

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Land snails of the genus *Ashmunella* Pilsbry & Cockerell, 1899, located on White Sands Missile Range (WSMR; New Mexico, USA) and Fort Bliss (New Mexico and Texas, USA) represent relict taxa that display a marked pattern of endemism and exist in fragmented subpopulations. As a result of military security (both installations are closed bases with restricted entry), the malacofauna of WSMR and Fort Bliss have been little studied (Metcalf & Smartt, 1977; Metcalf & Smartt, 1997; Kroll et al., in press), and mostly with regard to distribution and systematics. However, a 2 year field study and a comprehensive risk assessment analysis of *Ashmunella* populations have been completed (Boykin et al., 2001; Kroll et al., in press), allowing for a better understanding of the ecology and distribution of these threatened taxa. Four of the resulting findings are presented here.[1]

[1] Voucher specimens of all taxa discussed here were deposited with Dr. Art L. Metcalf, University of Texas–El Paso.

Ashmunella harrisi Metcalf & Smartt, 1977, is known to occur in only two unnamed canyons that drain the east face of Goat Mountain, San Andres Mountains, WSMR. Shells of this species have been found at only six localities, and live specimens are known only from Metcalf & Smartt (1977). On 27 July 1999, I found one live *A. harrisi* at an isolated site (the type locality; Metcalf & Smartt, 1977) in the southern canyon, and on 26 September 1999, I found six live *A. harrisi* at an isolated site in the northern canyon. Despite extensive searching on repeated occasions, I found no live *A. harrisi* at the other four localities, nor did I find evidence that other populations existed in nearby locales. This section of WSMR is within a live-fire range, and target debris is found in habitats occupied by this species. *Ashmunella harrisi* is the most restricted in distribution of the taxa under consideration, and the species appears to be extremely rare. Careful consideration of military activities and close monitoring of subpopulations (specific recommendations are made by Boykin et al., 2001) may be required to prevent extinction of this species.

Vagvolgyi (1974) placed the type locality for *Ashmunella auriculata* Vagvolgyi, 1974, in Boulder Canyon, Organ Mountains, Fort Bliss. Metcalf & Smartt (1997) thought this locality was in error because they had found *A. auriculata* only in the northern Organ Mountain and the only species that had been found on their visits to Boulder Canyon was *Ashmunella organensis* Pilsbry, 1936. However, on 18 September 2000, I located *A. auriculata* shells at three different localities in the upper reaches of Beasley Canyon, which lies due north of Boulder Canyon over a low ridge. In addition, live specimens were located at one of these localities. However, no specimens, live or dead, were located in Boulder Canyon proper. Thus, Vagvolgyi's type locality seems only to be imprecise, and not inaccurate.

Given this finding, the known distributions of *A. auriculata* and *A. organensis* are of particular interest. Although subpopulations of each species can be found within a mile of one another in both Fillmore and Soledad Canyons, Organ Mountains, no areas of sympatry have been documented. Hybridization events have been reported for other *Ashmunella* of WSMR and Fort Bliss (Sullivan & Smartt, 1995; Metcalf & Smartt, 1997) and given the wide range of habitats occupied by *A. organensis* (Kroll et al., in press), the lack of sympatry between these two species is curious. However, surveys in the Organ Mountains have not been exhaustive (e.g., despite visits by malacologists to the Organ Mountains for well over 75 years, a new species was located and described as late as 1997; Score & Metcalf, unpublished manuscript) and hybrid populations may be discovered by future workers.

On 25 August and 27 August 1999, I observed firefly larvae (Coleoptera: Lampyridae) feeding on *Ashmunella kochii kochii* Clapp, 1908. The conditions were overcast

and rainy, and on both occasions ~300 living *A. kochii* were observed on the surface of the talus slope. Nine instances of predation were witnessed, and in each case the larva appeared to have consumed the entire soft anatomy of the snails. In addition, both adult and juvenile *A. kochii* were attacked by the lampyrid larvae.

The Lampyridae are well known predators of land snails (Balduf, 1935; Borror & DeLong, 1954; Schwalb, 1960) but predation on *Ashmunella* has not been reported in the field. Lampyrid larva and *Ashmunella* most likely share similar habitats (talus accumulations and leaf litter; Stehr, 1991), but predation may occur only when *Ashmunella* emerge from the deeper recesses of talus accumulations, as in the monsoon season (July to September) in southern New Mexico and western Texas. I often found dead larvae close to the surface of talus piles, while *Ashmunella* shells frequently require some digging to locate.

Finally, I witnessed two instances of predation of *Ashmunella* by birds. On 11 October 1999, I watched an adult female roadrunner (*Geococcyx californianus*) foraging on adult *A. organensis* on a talus slope in Soledad Canyon, Organ Mountains. The bird moved about the talus slope and appeared to smash seven individual snails with two quick raps from its beak. After the bird moved off, I was able to find a few remaining pieces of shell, but no soft tissue.

The second incident of predation by birds was more extensive. On 31 July 2000, while surveying for *Ashmunella salinasensis* Vagvolgyi, 1974, on Salinas Peak, San Andres Mountains, WSMR, I began to encounter freshly smashed adult and juvenile snails. Several rock wrens (*Salpinctes obsoletus*) were foraging on the slopes, and upon closer observation, it became clear that they were smashing and at least partially consuming the snails. As with the roadrunner, the rock wrens broke the shells with repeated strikes of their beaks. The attacked snails that I located had most of their soft tissue remaining, in contrast to those that were wholly consumed by the roadrunner.

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Observations of Predation on the Tropical Nudibranch *Okenia* sp. by the Sea Spider *Anoplodactylus longiceps* Williams (Arthropoda: Pycnogonida)

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We know very little about what preys on sea slugs (Piel, 1991), and especially on tropical species. Predation of opisthobranchs by pycnogonids has been documented several times from warm temperate habitats (Piel, 1991; Rogers et al., 2000). The following laboratory observations of the chelate pycnogonid *Anoplodactylus longiceps* Williams, 1941, feeding on the nudibranch *Okenia* sp. were recently obtained from samples of an intertidal microhabitat in tropical north Queensland, Australia.

In August 1999 fresh samples of the green alga *Cladophora prolifera* (Roth), were collected from the intertidal (low tide 0.4 m) sandy-muddy beach at Rowes Bay, Townsville, Australia (19°14′S, 146°47′E). Immediately after the field collection, tufts of *C. prolifera* were examined for sea spiders. Several species of sea spiders